

WasteWise Update



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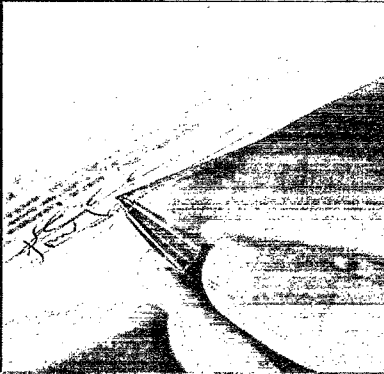
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RESOURCE MANAGEMENT: STRATEGIC PARTNERSHIPS FOR RESOURCE EFFICIENCY



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Finding Resource Efficiency in Solid Waste Contracts

D*espite tremendous initial successes with recycling and waste diversion programs, the growth of recycling rates in many states has plateaued to only a few percentage points increase each year. Even as the amount of waste recycled nationwide has increased each year, it has barely kept pace with increases in generation. Although organizations that generate waste are often eager to improve in this area, optimizing trash and recycling services is often not a priority, given more pressing financial and strategic concerns. This suggests the need for a new approach to help organizations better leverage waste management resources to boost recycling rates and decrease generation.*

Enter Resource Management (RM)—a new concept of partnering with contractors to improve recycling rates, waste prevention, and other cost-saving resource efficiencies. Because contracts are used to manage virtually all waste generated by non-residential sources and two-thirds or more of municipal solid waste, RM presents a powerful means to advance waste reduction and recovery. More importantly to resource- and time-constrained waste generators, it provides the opportunity to influence external expertise to achieve reductions while maintaining or decreasing base waste management costs.



What Is RM Contracting?

RM is a strategic alternative to disposal contracting that seeks to continually improve resource efficiency through enhanced source reduction, recycling, and recovery. By tying incentives to the value of services that foster prevention, reuse, and recycling—with disposal as the last resort—RM encourages alignment of contractors' activities with the customers' in a new type of joint effort. This is currently the exception, rather than the rule, in integrated solid waste management contracting, however.

More Bang For The RM Buck

RM is based on the idea that contractors will pursue resource efficiency opportunities when offered proper financial incentives. For example, RM contracts might cap disposal costs based on current costs and then include a gain-sharing arrangement for successful waste reduction projects initiated by the contractor. Thus, if contractors identify cost-effective recycling markets for disposed materials or techniques for preventing waste altogether, they receive a portion of the customer's savings from their innovation. This arrangement enhances recovery of readily recyclable materials, such as corrugated cardboard and wood pallets, while promoting market development opportunities for difficult-to-recover materials such as paint sludge and solvents.

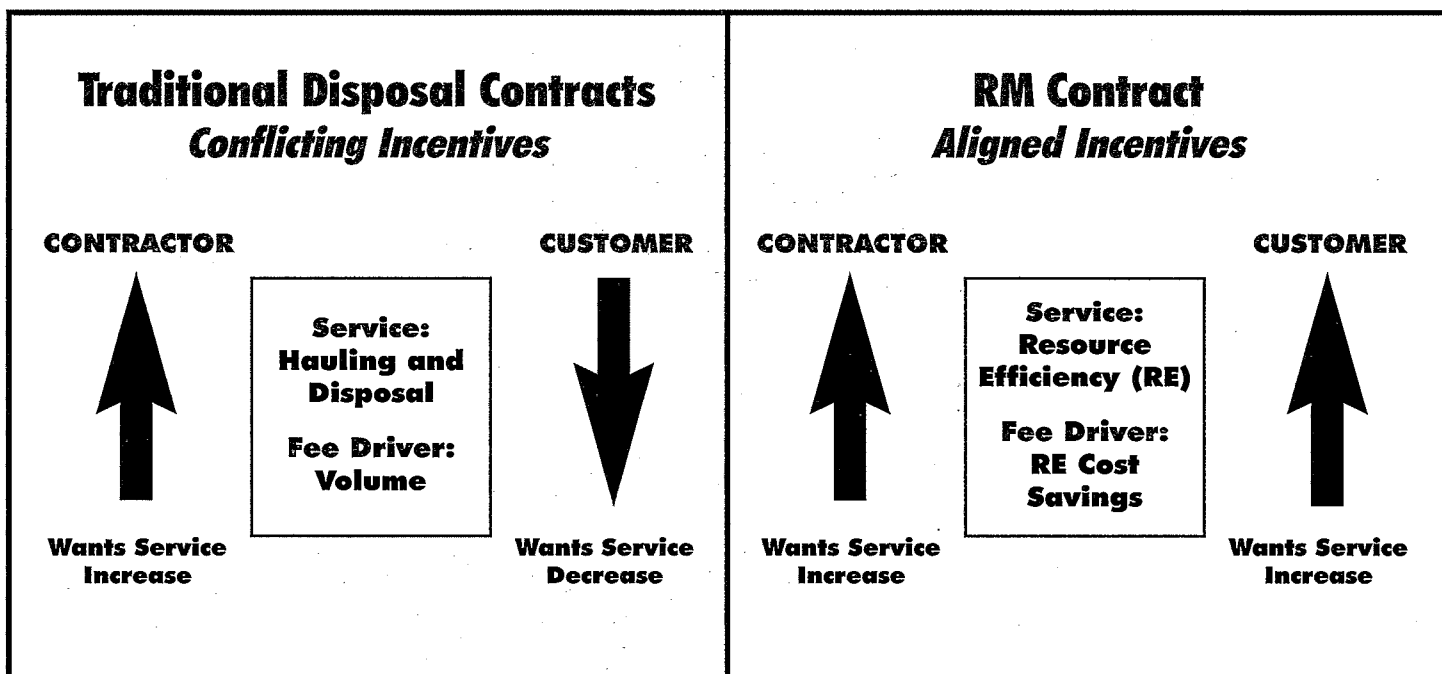
As a result, RM fosters a business-driven, corporate commitment to make waste reduction and pollution prevention a priority. Although RM might improve corporate reputation, employee morale, safety, and other intangibles that contribute to competitive advantage, potential RM customers often understand issues better in financial terms. The most appealing facet of RM to decision-makers, therefore, might be its cost-saving or cost-neutral nature, which seeks higher resource efficiency and additional services for each dollar currently spent.

RM is not a new concept. Many progressive organizations maintain that they have had RM-like contracts in place for years. RM follows some of the concepts of the performance-based contracts first utilized by energy service companies in the 1970s. In the solid waste sector, WasteWise partner General Motors adopted the term "resource management" to describe their efforts to restructure contracts to reach corporate waste reduction goals in the mid-1990s.

What Distinguishes RM Contracting?

Typical disposal contracts send precisely the wrong economic signal to waste management contractors: more waste equals more profits. For this reason, they impede serious progress in resource efficiency by providing a profit

Figure 1: Contractor and Customer Incentives in Traditional Disposal and RM Contracts



incentive for disposal. RM contracts contain the types of incentives that align waste contractor incentives with those of their customers (see Figure 1 on page 3). The basic features of RM contracts are fundamentally different from those of traditional hauling and disposal contracts in three key areas: compensation and incentives, the type of contractor-customer relationship engendered, and the nature and variety of services offered (see Table 1 below).

By changing the ways in which organizations demand and pay for integrated waste management services, RM has the potential to transform the waste disposal industry into a sector that profits from mutually beneficial resource efficiency gains, rather than ever-increasing quantities of waste. Traditional waste management contracts specify services that begin at the Dumpster and end at the ultimate point of disposal—normally a landfill or incinerator (see activities shown at far right of Figure 2 on page 5). In contrast with this exclusively external focus, an RM contractor addresses both external waste management activities and internal activities that affect waste generation. In more advanced forms, RM can lead to: more efficient material use, storage, and ordering; reduced purchase costs; or ultimately more resource efficient product or process design (see Figure 2).

The resource efficiency impacts of these activities tend to multiply, so the value of these savings—and hence the profitability for the RM contractor and customer under this arrangement—can be quite large when compared to external diversion savings alone.

RM can work in industrial and non-industrial settings. In public institutions and/or small businesses, for example, RM contractors might work closely with internal janitorial and administrative staff to optimize resource efficiency. In municipal residential settings, an RM contractor might assume a more active role in public education and outreach to foster increased participation in recycling. Regardless of the organization type or source of resource efficiency, the generator and RM contractor share the savings.

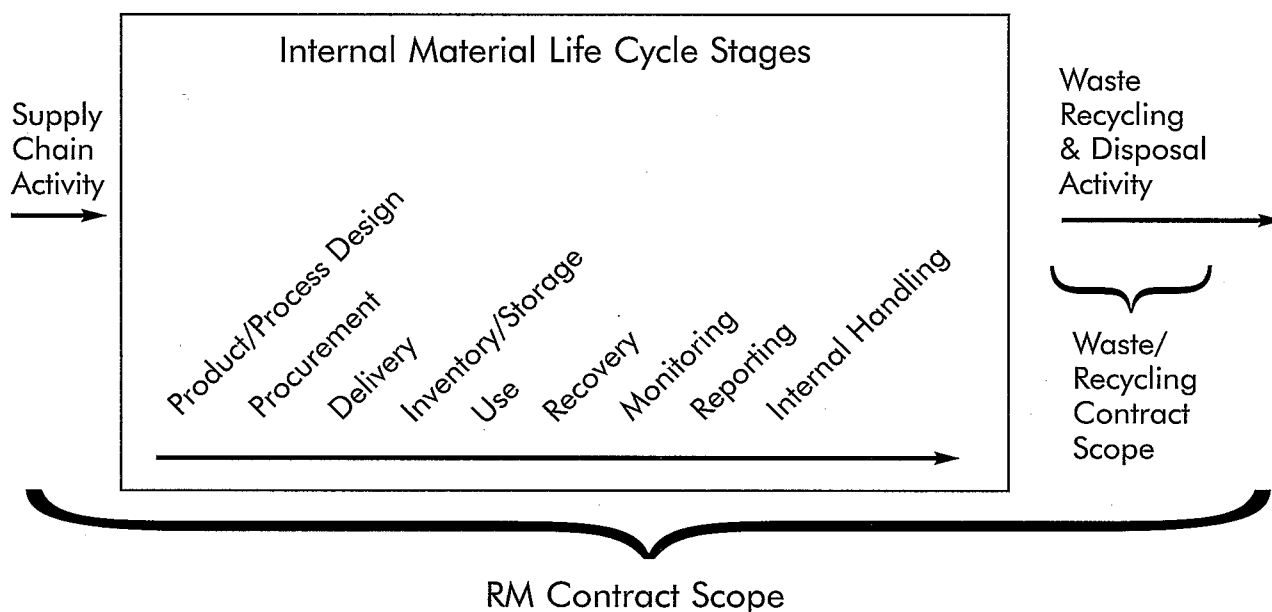
Partners Realize RM Results

This *WasteWise Update* features case studies demonstrating how WasteWise partners are using RM contracting to increase resource efficiency and save money. As the RM concept originated with General Motors, the first case study shows how GM's Orion Assembly Plant managed to substantially improve its service levels and simplify contracts,

TABLE 1: DISTINGUISHING FEATURES OF TRADITIONAL CONTRACTS VS. RM CONTRACTS

Features	Traditional Waste Contracts and Recycling Arrangements	RM Contracts
Scope of Service	<ul style="list-style-type: none"> • Container rental and maintenance, hauling, and disposal or processing. Contractor responsibilities begin at the Dumpster and end at the landfill or processing site. 	<ul style="list-style-type: none"> • Services addressed in traditional hauling and disposal contracts as a last resort, plus services that inform and influence waste generation (i.e., product/process design, material purchase, internal storage, education on material use and handling, data management, reporting).
Contractor Compensation and Incentive Structure	<ul style="list-style-type: none"> • Unit price based on waste weight and/or number of pick-ups. • Recycling often non-contractual "add-on" or "free" service provided by same contractor or other provider. <p>Contractor incentive: Maximize waste service and volume; no integration with recycling/diversion/source reduction services.</p>	<ul style="list-style-type: none"> • Decouple contractor profitability from waste disposal and/or service levels by "capping" total organization-wide waste and recycling costs, then tying compensation to waste minimization. • Performance bonuses based on and financed from demonstrated resource efficiency savings from documented baseline. <p>Contractor incentive: Seek savings through recycling/diversion and other resource efficiency innovations.</p>
Customer-Contractor Relationship	<ul style="list-style-type: none"> • Minimal interface and collaboration between waste generator (including all stakeholders influencing waste) and contractor. 	<ul style="list-style-type: none"> • Strategic alliance: waste generator and contractor work together to derive value from resource efficiency.

Figure 2: RM Contract Scope in Typical Industrial Setting



achieving savings of 30 percent during the first 3 years of the contract and improving the per vehicle recycling rate from 7 percent to 38 percent.

For **Public Service Enterprise Group**, RM emerged with the implementation of a supply chain management process administered by its Resource Recovery Group. Accomplishments through this program, which incorporates RM contracting, include greater than a 90 percent recycling rate for non-hazardous waste during the last 5 years, a 93 percent reduction in hazardous waste generation from 1992 to 2000, and cost savings of roughly 25 percent from 1994 to 1996.

CB Richard Ellis-Whittier Partners (CBRE) has implemented several business practices at its One Beacon Street property that are consistent with the spirit of RM contracting. Although CBRE does not rely on or provide contractual

incentives to a single-source RM contractor (as the typical RM model does), its success with its own internal approach demonstrates how RM concepts can work to create partnerships to improve recycling and implement other cost-effective resource efficiency efforts.

For a perspective on how potential suppliers of RM services view this concept, read how WasteWise partner **Waste Management** and others are benefiting from actively marketing resource efficiency services. Finally, learn about the next steps for RM, including upcoming WasteWise tools and guidance on RM, and how to get started with this contracting strategy.

Additional RM information and resources are available on the WasteWise Web site at www.epa.gov/wastewise/wrr/rm.htm.

Creative Contracting at General Motors



When it comes to waste management contracts, General Motors (GM) Corporation continues to think outside the box. GM, WasteWise Partner of the Year in 2001, employs approximately 372,000 people at facilities around the globe and generated more than \$183 billion in automotive sales in 2000. The company adopted RM contracting as a logical outgrowth of its success with a similar performance-based contracting system for chemical purchasing, use, and management.¹ After piloting the idea at a German facility in 1991, GM expanded RM to five North American facilities between 1996 and 1998. All GM plants in the United States will have resource management by 2003 where it is viable.

"There are no waste streams, only wasted resources."

- Raj Mishra, GM Corp.

The Orion Assembly Plant in Orion Township, Michigan, was GM's first RM pilot facility in North America. The facility currently comprises more than 4 million square feet and employs more than 4,000 workers. From 1996 to 2000, Orion produced an average of 185,000 cars and generated an average of more than 17,500 tons of waste annually.

As Table 1 indicates, RM provided the Orion plant with a substantial improvement in service levels and administrative simplicity. The switch streamlined management by reducing nine waste management contracts to one single contract.² More significant benefits included guaranteed annual cost reductions, the full-time services of two onsite resource managers, a waste tracking system, and improved employee training. Table 2 (on page 8) details how the Orion Assembly Plant utilized the contracting process to enhance performance levels while decreasing fixed costs and creating incentives for waste reduction and diversion.

Benefits of Resource Management

The Orion facility experienced substantial financial and environmental benefits as a result of RM contracting. Savings exceeded 30 percent during the first 3 years, and the per-vehicle non-scrap recycling rate increased more than

TABLE 1: RM SERVICE ENHANCEMENTS AT THE GENERAL MOTORS ORION ASSEMBLY PLANT

Services Before RM: Nine Contracts

Hauling (2 contracts)
Disposal (4 contracts)
Consulting studies
(1 contract)
Waste Pad Assistance
(1 contract)
Sludge Clean Out
(1 contract)

Services After RM: One Contract

Hauling
Disposal
Waste Pad Management
Comprehensive Studies
Two On-site RM Managers*
Offsite Support*
Comprehensive Recycling*
Environmental Reports*
Waste Tracking Systems*
Staff Training*

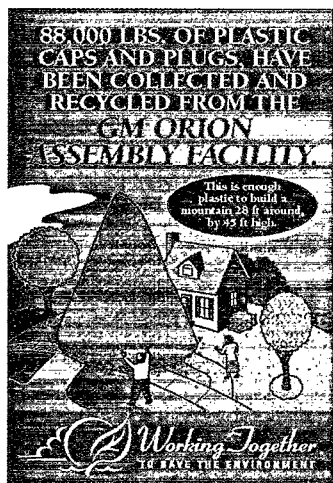
* = New Service

¹ GM has practiced chemical management for more than 15 years. For more information on chemical management services, see <www.chemicalstrategies.org>.

² The Orion RM contract does not include metal scrap, which a separate corporate team handles because of its high value and the cost advantage of using specialized scrap companies that provide the best return.

400 percent during the life of the contract, from approximately 7 percent to approximately 38 percent.³ Michael Schafran, senior environmental engineer, credits RM with successfully helping Orion to decrease waste, improve recycling rates, and reduce the costs for several waste streams. The resource manager implemented new recycling programs for fly ash, wood pallets, corrugated cardboard, plastic caps, fluorescent bulbs, cafeteria grease, and batteries. The plant also moved from spending to earning money on recycling. Three highlights of RM at the Orion plant include:

- **Recycling fly ash:** The coal-burning process, which feeds Orion's onsite powerhouse boilers, generates a significant level of fly ash—more than 3,700 tons in 2000. Prior to 1997, the facility landfilled all of the ash. In 1997, the resource manager began investigating new uses for the fly ash, which represented GM's second largest waste stream in tonnage and disposal costs in 1996. After approximately 6 months of investigation and experimentation, Orion formed a partnership with the Scotts Company in Michigan to utilize the fly ash in Scotts' Hyponex potting soil. Although Orion pays Scotts to take the fly ash, the arrangement reduces landfilling and saves the plant approximately \$10 per ton in tipping fees, amounting to an estimated net savings of \$40,000 in 1999.
- **Recycling/reusing plastic caps and plugs:** Suppliers deliver engines, pipes, pumps, and many other parts with plastic plugs and caps to keep dirt and other contaminants away from part openings. These caps and plugs number in the millions annually, yet they seemed relatively innocuous when tossed individually into the trash by workers. When the resource manager asked assemblers to place the caps in recycling bins, the enormity of this waste stream became clear. Orion now sends the caps and plugs to organizations employing disabled individuals to sort for recycling and/or reuse at no cost to Orion. In 2000, this program recycled or reused 44 tons of plastic. GM is expanding this program to other facilities.
- **Recycling cafeteria grease:** Prior to the RM contract, Orion's two onsite cafeterias generated one or two drums of cafeteria grease per week. The plant added the drums to its higher cost hazardous waste streams, but at the direction of the resource manager, the cafeteria grease



Benefits of RM Implementation at GM's Orion Assembly Plant

- 30 percent reduction in waste management expenses in the first 3 years.
- 25 percent reduction in per-vehicle waste.
- 400+ percent increase in per-vehicle non-scrap recycling rate.
- Improved service levels (see Tables 1 and 2), including enhanced data systems.

now goes to a company that refines it for use in dog food and cosmetics. Orion pays the grease-refining company a fee that is substantially lower than landfill fees.

Challenges of Resource Management

Although GM currently operates a successful RM program, the company encountered its share of obstacles. In 1999, for example, a new in-plant corrugated cardboard recycling program diverted 615 tons from the waste stream; however, this diversion decreased to 118 tons the following year, partially due to a substantial reduction in revenues for mixed cardboard recycling. The decreased price for cardboard discouraged the facility and the resource manager from mobilizing additional resources to improve onsite sorting of cardboard. This is understandable, considering that RM contracts drive source reduction and waste diversion via profit incentives, which encourage the RM contractor to pursue those opportunities that will fetch the highest market price. Future RM contracts can counter this tendency by specifying minimum targets for recycling and linking performance bonuses to those targets.

As the Orion RM program enters its fifth year, Mr. Schafran contends that substantial waste reduction will be more difficult to achieve, now that the plant has implemented the easiest and most profitable recycling and reuse activities. To obtain higher waste reduction rates and further cost savings, Orion might choose to seek source reduction opportunities by refining production processes, which "raises the bar," Mr. Schafran adds. Finally, RM provides an incentive for GM's contractor to research and help create new markets for materials that would otherwise be landfilled. As it might become increasingly difficult for RM suppliers to maintain profitability from recycling alone, a flexible compensation structure might serve as a key ingredient that allows the supplier to profit from implementing other "upstream" resource efficiency improvements.

For more information about GM's experience with RM contracting, please contact Warren Underwood at 248 680-5934 or send an e-mail to <o.w.underwood@gm.com>.

³ This calculation does not include scrap metal. A separate team at Orion recycles all scrap metal.

TABLE 2: SUMMARY OF GM'S ORION ASSEMBLY PLANT RM PRACTICES

RM Practices	GM's Orion Assembly Plant
Establish baseline cost, performance, and service levels	<ul style="list-style-type: none"> • Orion analyzed its waste streams and costs and prepared an internal cost book before releasing a request for proposal (RFP) with cost targets for bidders to meet. Orion solicited additional information from three of five original bidders before selecting the final contractor. • The RM contract includes an annual cost review to reassess the validity of the baseline data and to compare the anticipated waste reduction target with the actual achieved result. Initially, both sides were uncertain about the accuracy of baseline data and the benefits of the contract. Orion expressed concern that the contract might lock in high prices if market prices dropped. On the other hand, the contractor was unsure about cooperating with facility personnel to institute source reduction and waste diversion programs, both of which contribute to the contractor's profits (see practice for capping compensation below). The annual review helps assuage these concerns by allowing both parties to adjust the contract to reflect actual waste data and waste management costs for the current year. • A comprehensive waste data system required by the contract facilitates the annual cost review. The resource manager now uses dated and numbered drums to keep track of waste generated at all plant sites, as well as the location and status of the waste as it moves to the waste pad and then off site.
Transform contractor roles and relationships	<ul style="list-style-type: none"> • Orion's RM contract consolidated previous waste management services. • The RM contract provides onsite resource managers to train GM staff, track waste, and prepare environmental reports. • GM also gained support for its RM program from the local chapter of the United Auto Workers.
Align waste and resource efficiency services	<ul style="list-style-type: none"> • By combining responsibilities for waste handling, disposal, and recycling and creating an enhanced data management system, the contract enables the in-plant resource managers to identify opportunities to improve waste reduction.
Establish transparent pricing for services	<ul style="list-style-type: none"> • Orion's 3-year contract includes all of the services listed in Table 1 (page 6) for a single, total annual fee. Except for management services, the RM contractor provides all services at cost. GM created a staffing/management fee in the contract to separate profits from volumes of waste (e.g., 1 cent per ton) with the intent of increasing price transparency and removing disincentives for waste reduction or diversion.
Cap compensation for garbage service	<ul style="list-style-type: none"> • The contract requires a decrease in waste management costs each year to guarantee savings for GM. Because the percent of waste reduction has decreased each year, marginal gains will likely grow smaller over time. Additional savings either accrue directly to the contractor or the contractor shares the savings with GM.
Provide direct financial incentives for resource efficiency	<ul style="list-style-type: none"> • Orion currently receives 50 to 70 percent of recycling revenues created by the contractor's initiatives. • The contract does not provide for direct profit-sharing related to reduced landfill fees. Although the RM contractor reaps all profits related to reduced tipping fees during the year that the benefits occur, the annual cost review ensures that Orion shares those benefits in future years. • The RM contractor also has the opportunity to capture additional business within the Orion plant not originally included in the RM contract. For example, the contractor might be interested in providing other services such as industrial cleaning for demolition. By building trust and establishing contacts within the plant, the resource manager might find it easier to win such work from the plant, particularly when it involves smaller projects (i.e., under \$50,000) for which GM procurement regulations do not require open bidding.

Resource Management Energizes PSEG's Profits

For WasteWise partner Public Service Enterprise Group (PSEG), a 2001 Partner of the Year, implementing RM practices was a natural step in the growth of the energy company's waste management program. PSEG, a \$21 billion energy services company, owns and operates power generation and distribution facilities throughout the world. The corporation employs approximately 13,000 employees and operates approximately 120 fossil and nuclear power generation, distribution, and other facilities in New Jersey, New York, Pennsylvania, and Ohio.



Program Structure and Scope

After initiating a corporatwide supply chain management process in 1993, PSEG formed the Resource Recovery Group to provide integrated waste management services. The supply chain management process aimed to minimize the life cycle cost of client services by incorporating waste prevention strategies into all components of the material supply chain. The Resource Recovery Group specifically administers initiatives for hazardous waste minimization and non-hazardous waste recycling. Initially, PSEG intended for the Resource Recovery Group to consolidate the waste management vendor base at its 120 facilities and to establish strategic partnerships with waste vendors to achieve high environmental performance and reduce waste disposal and management costs. Over time, the program has evolved to obtain value-added services to improve data management, reduce waste, and increase recovery of non-hazardous and hazardous materials.

Contract Process and Structure

Through a competitive bid process, PSEG awarded a 2-year master contract for non-hazardous waste to DiMarco Services in 1993 and an additional 1-year master contract for hazardous waste to Clean Harbors in 1995. Intending to develop and maintain a strategic supplier partnership, PSEG awarded these two master contracts with an option to renew. PSEG extended both companies' initial contracts for two subsequent 3-year terms without a competitive process. In 2001, PSEG opened the non-hazardous waste contract for competitive bidding and awarded the contract to Waste Management, which acquired DiMarco Services. PSEG expects to re-bid the hazardous waste contract at its expiration in 2002.

"The beauty of the supply chain management process is that we now collaborate with vendors to harvest the lost recovery/recycling opportunities that were apparent to us as waste. In sharing the responsibility and benefit, both parties are now organizationally aligned to the process."

-Al Fralinger, PSEG

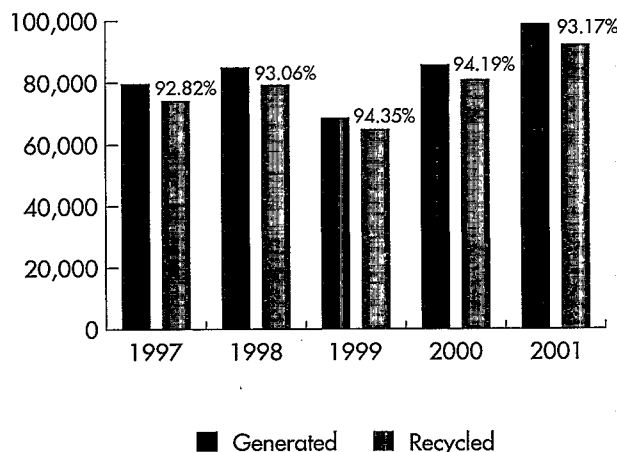
When it began the supply chain management process, PSEG conducted a pilot program, initially engaging 40 facilities. The program has expanded to virtually all 120+ facilities today due to its success. Although the two master contracts are not exclusive, and opera-

tion units can select their own waste vendors, the Resource Recovery Group finds that the two master vendors have an advantage in offering competitive prices based on volume leverage and cost reduction and providing additional no-cost, value-added services.

For non-hazardous wastes, Waste Management is responsible for hauling, off-site sorting/separation, recycling/reuse, and disposal services for all regularly generated waste. Waste Management transports commingled waste and recyclables to its automated materials recovery facility to sort and separate wastes for reuse and recycling. Offsite sorting and separation ensures a high recycling rate—more than 94 percent in 2000 (see Figure 1 at right)—and frees employees to focus on PSEG's core business. Waste Management also provides waste data in a format compatible with the Resource Recovery Group's data systems and, like Clean Harbors, uses a transparent self-audit process at its waste disposal facilities, saving the Resource Recovery Group's travel and labor expenses. The Waste Management contract now excludes several non-hazardous waste streams, including street lamps, coal ash, scrap metal, and electronics. These waste streams are either sporadic in nature or have existing recycling programs with product manufacturers or specialized companies.

Under the present hazardous waste contract, Clean Harbors not only provides regular treatment, transportation, and disposal services, but also helps with legal indemnification, provides onsite management services and single

Figure 1: PSEG's Level of Solid Waste Generated and Recycled (in tons) 1997-2001



billing, and works with PSEG to reduce hazardous waste generation (see Figure 2 on page 11). Additionally, Clean Harbors offers hazardous materials and other training to PSEG staff, provides waste accounting data, and self-audits its waste disposal facilities for PSEG at no additional cost, saving the client money that would normally be spent to acquire services separately.

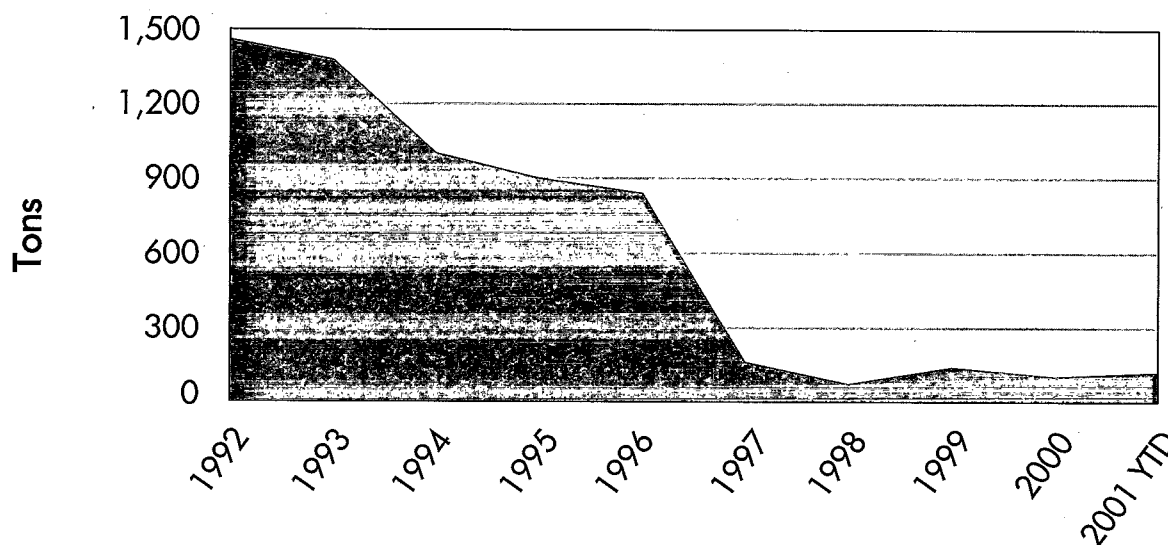
Benefits of Resource Management

PSEG has found that the RM model is invaluable for building strategic partnerships with contractors to reduce waste and the associated costs. RM simplifies the corporation's waste management processes and helps PSEG focus on its core business. By using the RM strategy, PSEG:

- Reduced hazardous waste volumes from 1,460 tons to 103 tons between 1992 and 2000.
- Reduced total waste management costs for both hazardous and non-hazardous waste from \$6 million to \$4.25 million during an 18-month period from 1994 to 1996.
- Recycled more than 94 percent of non-hazardous waste, representing 80,712 tons of materials in 2000.
- Reduced waste management supplier base from 40 vendors to 1 for hazardous waste and from 35 vendors to 1 for non-hazardous waste, reducing contract management costs and allowing for market share leveraging and partnership opportunities.
- Used strategic partnership to regularly work with vendors and provided business opportunities to help solve waste issues.

TABLE 1: DRIVERS AND CHALLENGES TO PSEG'S RM PROGRAM

Drivers	Challenges
<ul style="list-style-type: none"> • Top management support. • Regulatory pressure including mandatory recycling. • Society's demands for corporate social responsibility and improved environmental performance. • Deregulated gas and electricity market forcing industry to cut costs and boost efficiency. • Inability to assess baseline cost and performance due to the lack of data or inconsistent formats from numerous vendors. 	<ul style="list-style-type: none"> • Lack of data at the outset, making it difficult and time consuming to define a direction, design a program, and evaluate potential benefits. • Variable client requirements and need for flexibility. • Organizational change and ensuring that management at the distinct operation units think of the company as a whole. • A decentralized environmental and purchasing responsibility led to internal resistance as some facilities feared losing purchasing power.

Figure 2: PSEG's Hazardous Waste Generation Trends

YTD: July 2001

- Allowed vendors to establish an understanding of client processes and to build institutional knowledge that augments their effectiveness in developing solutions.
- Outsourced recycling and waste services to leverage vendors' core competencies and obtain other affiliated services, such as training and auditing for legal due diligence, often free of charge. This allowed PSEG to save internal resources for other business needs and at the same time achieve a higher recycling rate.
- Reduced the Resource Recovery Group's labor in establishing and maintaining a corporatewide central waste accounting system by achieving standard waste stream characterization and by profiling more than 170 waste streams across the corporation's 120 facilities.
- Achieved recognition for environmental performance, differentiating PSEG from other utilities in a deregulated energy market. PSEG has won multiple awards from the New Jersey Department of Environmental Protection and WasteWise.

Keys to Success

According to Al Fralinger, manager of the Resource Recovery Group, PSEG has found successful RM implementation relies on the following efforts:

- Gaining support from senior management.
- Incorporating life cycle analysis throughout the supply chain management process.
- Involving all internal stakeholders.
- Shifting from "squeezing" supplier prices to seeking cost reductions and sharing opportunities.
- Piloting an RM program to sell its success for a corporatewide launch.
- Launching the program in phases by waste stream and facility.
- Educating suppliers through pre-bid meetings and continuing regular supplier development meetings to encourage strategic partnerships.
- Establishing and maintaining a centralized waste accounting system with vendor's assistance.

For more information about PSEG's experience with RM contracting, please contact Al Fralinger at 856 224-1638 or send an e-mail to <albert.fralinger@pseg.com>.

TABLE 2: SUMMARY OF PSEG'S CONTRACT STRUCTURES AND RM PRACTICES

RM Practices	PSEG
Establish baseline cost, performance, and service levels	<ul style="list-style-type: none"> • In 1993, PSEG established goals to achieve a 75 percent recycling rate for non-hazardous waste and a 30 percent reduction in hazardous waste. After achieving these goals by 1995, the company set its current target to maintain a recycling rate above 94 percent for non-hazardous solid waste. • PSEG established baseline waste generation rates and costs to evaluate bids and issue contracts. Due to the uncertainty in its numbers, PSEG continually refines its data with input from waste vendors. • The company set quantitative and qualitative internal performance targets, including waste minimization, safety, timely responses, and training.
Transform contractor roles and relationships	<ul style="list-style-type: none"> • PSEG conducted a series of pre-bid meetings to articulate goals of the resource recovery program to all original vendors before the program's inception. The corporation continues to meet with vendors to discuss operational issues and prepare vendor guidelines that clarify PSEG and vendor expectations. • With the exception of specialized waste streams, PSEG consolidated all waste management responsibility with one hazardous waste vendor and one non-hazardous waste vendor. • To supplement regular waste treatment and disposal services, the master contract provides for value-added services such as staff training, audits of waste disposal facilities, timely waste data in a readily useable format, and assistance in establishing electronic data interchange. • PSEG adopted a new strategic mindset to work with vendors to devise mutually beneficial resource efficiency solutions. PSEG strives to provide its vendors with additional business opportunities when they arise.
Align waste and resource efficiency services	<ul style="list-style-type: none"> • The Resource Recovery Group manages all waste vendor contracts and services. • The group acts as an intermediary to facilitate communications between the master waste vendors and the distinct operating facilities. This enhances a mutual understanding by both parties and expedites identification of resource efficiency opportunities. • The overall strategy consolidates waste and recycling services with two vendors, opening lines of communication and aligning all vendors to meet PSEG's resource efficiency goals. It also avoids the administrative costs of managing multiple vendors.
Establish transparent pricing for services	<ul style="list-style-type: none"> • PSEG created the present contracts using "unbundled" pricing structures, which delineate hauling and disposal fees, such as cost per haul and cost per ton tipped, on a variable basis. Some heavy and high volume materials have a per ton lump disposal fee that includes transportation and recycling or disposal. • The corporation's contracts factor the revenue from recyclables into the unit price charged for waste management and recycling services.
Cap compensation for garbage service	<ul style="list-style-type: none"> • Contracts do not specify compensation caps, and change orders are possible if the work charged goes beyond the bid amount. • According to PSEG, the nature of the strategic relationship it has established is a de facto cap that decouples contractors from the typical waste-equals-profit model. It is the contractors' waste reduction performance that largely dictates their chance of extending the master contracts, which would ensure long-term profit and other benefits.
Provide direct financial incentives for resource efficiency	<ul style="list-style-type: none"> • A waste reduction performance bonus incorporated in the first hazardous waste contract motivated the vendor to achieve a 30 percent reduction in hazardous waste between 1995 and 1996. This was greater than the initial 10-percent reduction target. • In future contracts, PSEG might institute performance bonuses that will provide vendors with incentives to continue to perform and find waste reduction opportunities. • PSEG committed to identify opportunities for additional work outside the original contract scope for the hazardous waste vendor for achieving contract goals. • Although the present contracts do not lead to direct gain-sharing, the implied benefits from maintaining a long-term strategic partnership with PSEG encourages waste vendors to achieve high performance standards and meet waste minimization targets. Vendor benefits include: locking in a long-term, high value contract for a large part of PSEG's business, saving the contractor resources from a re-bid; gaining valuable experience by working with the utility industry and enhancing their competitive edge within this sector; and gaining an inside track to other potential business opportunities outside the contract's scope.

CB Richard Ellis–Whittier Partners Rises to the Challenge

CB  Richard Ellis

One Beacon Street is a high-rise office building in Boston with more than 1.1 million square feet and 3,500 various tenants. By implementing components of RM, WasteWise partner CB Richard Ellis (CBRE)–Whittier Partners, the building's leasing and property management company, reduced waste and recycling costs by 60 percent and increased One Beacon Street's recycling rate by more than 60 percent.

Program Structure and Scope

Jim Fox, CBRE's general manager of One Beacon Street, oversees all custodial, waste management, and recycling operations for the property. Although CBRE does not follow the typical RM model, it acts as a resource manager in terms of the way it structures contracts and determines how to use savings to provide incentives to tenants, custodial staff, and the waste/recycling contractor. Initiated in 1990, the RM program primarily targets the recovery of fiber waste such as mixed paper, newspaper, and corrugated cardboard. Presently, each tenant participates in an orientation and receives recycling and trash bins. Each day, the custodial staff collects and transports trash and recyclables from the offices to loading dock compactors, and a single waste/recycling contractor collects materials on an as-needed basis. For CBRE, teamwork among all the stakeholders of One Beacon Street is a key to RM success. Table 1 on page 14 depicts the building's stakeholders, their roles in RM implementation, and the incentives that motivate them to achieve waste reduction goals.

Benefits of Resource Management

In addition to reducing One Beacon Street's landfilled waste, RM helped CBRE realize cost savings and gain a

competitive advantage due the resource efficiency efforts of all stakeholders. The list below details the RM benefits at One Beacon Street:

- Increased the recycling rate from 28 percent in 1990 to more than 60 percent in 1999 and 2000, as well as participation rates and engagement of all stakeholders (e.g., custodial contractor, tenants).
- Received five consecutive "Race to Recycle" Awards from 1995 to 1999.¹
- Reduced waste and recycling costs by 60 percent through avoided disposal costs and increased recycling revenue.²
- Removed additional paper from the waste stream, resulting in a 30 percent compaction of waste and a reduction in pick-ups from five times per week to once per week. This resulted in saving \$21,000—approximately a 20 percent net savings—from reduced hauling and tipping fees in the first year.

"Our program uses cost savings on disposal service to fund internal recycling programs."

Jim Fox, CBRE

¹ The "Race to Recycle" is an annual recycling competition organized by WasteCap, the Building Owners and Managers Association, and the Massachusetts Department of Environmental Protection.

² Traditional waste removal can cost up to \$0.12 per square foot for an office building. By reducing waste costs, CBRE's RM program at One Beacon Street has reduced its costs by \$0.048 per square foot. For One Beacon Street, this represents \$48,000 in net operating income or \$564,700 in added value when capitalized at 8.5 percent.

TABLE 1: PROGRAM STAKEHOLDERS AND INCENTIVES CREATED THROUGH PROGRAM

Stakeholder	Role in RM Program	Incentives
Waste/recycling contractor	<ul style="list-style-type: none"> Provides containers as well as hauling and disposal/recycling services. Designs and delivers education and orientation programs (video and posters). 	<ul style="list-style-type: none"> Charges a flat fee (\$120/ton) for recyclable material to pay for recycling costs. When recycling commodity revenues go above the flat fee, the two parties split the difference evenly above the costs. Establishes a long-term, stable relationship with CBRE and One Beacon Street.
Custodial contractor	<ul style="list-style-type: none"> Transports waste and recyclables internally. Coordinates pick-ups with trash/recycling contractor. Conducts education via desk memos for tenants. Tracks, monitors, and reports data. 	<ul style="list-style-type: none"> Receives Thanksgiving turkeys for more than 90 staff members as a thank-you for supporting the program. Receives regular bonuses of \$100 for custodial staff. Receives a bonus of \$1,000 for custodial manager if One Beacon Street wins the "Race to Recycle" award.
Tenants	<ul style="list-style-type: none"> Support the program by recycling. Provide feedback on potential program improvements. 	<ul style="list-style-type: none"> Attend an annual appreciation breakfast if they achieve the highest recycling rate.
CBRE	<ul style="list-style-type: none"> Serves as the resource manager aligning stakeholder interests and services to maximize waste diversion. 	<ul style="list-style-type: none"> Seeks continuous improvement and added value for its clients at no cost. Establishes incentives to encourage better relationships with all stakeholders. Differentiates itself from competitors.

- Improved data tracking and information reporting, resulting in more efficient decision making.
- Upgraded services, including outreach, data tracking, and reporting, from the custodial contractor and recyclables collection from the waste contractor, at no additional charge.
- Created a competitive edge for CBRE, which differentiates its property management services from those of its competitors through this program.

Keys to Success

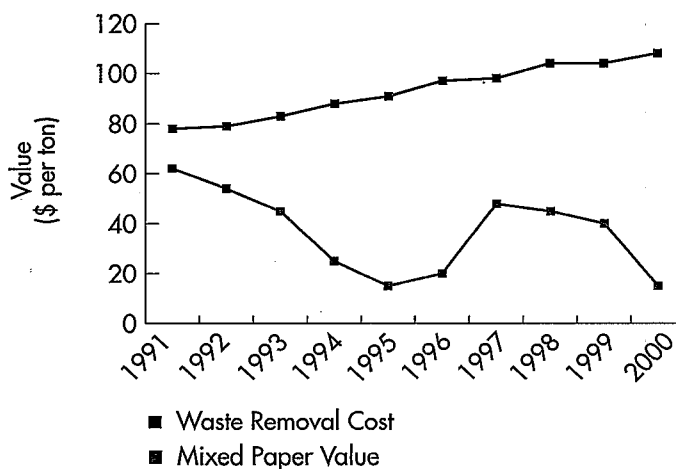
CBRE has found that its success using elements of RM relies on the following key efforts:

- Communicating with all stakeholders.
- Simplifying operations and compensation.
- Involving all stakeholders in team building process.
- Focusing on disposal cost avoidance (see Figure 1).
- Creating an incentive framework to allow for shared responsibility and shared rewards.
- Evaluating performance.

For more information about CBRE's experience using components of RM, please contact Jim Fox at 617 723-8616 or send an e-mail to <jimfox@1beaconst.com>.

Figure 1: Value of One Beacon Street Disposal Cost Avoidance vs. Recycled Commodity Revenue

Focusing on cost avoidance in recycling rather than income generation, CBRE can justify targeting the broader 65 percent of its paper stream, instead of only "high value" fiber commodity streams.



Contract Process and Structure

The table below details how CBRE's approach to contracting at One Beacon Street has aligned disposal and recycling services, produced strategic partnerships with vendors, and created incentives for all program stakeholders to work at increasing waste reduction and diversion.

TABLE 2: SUMMARY OF CBRE'S CONTRACT STRUCTURES AND RM PRACTICES

RM Practices	CBRE's One Beacon Street
Establish baseline cost, performance, and service levels	<ul style="list-style-type: none"> • CBRE continues to improve data tracking. • Monthly performance metrics include participation rates as well as waste and recycling levels. • CBRE established performance benchmarks and goals such as obtaining a minimum 65 percent waste reduction rate in 2000, assessing the possibility of increasing this percentage each year, and winning the "Race to Recycle" Award.
Transform contractor roles and relationships	<ul style="list-style-type: none"> • CBRE worked closely with its custodial and waste/recycling contractors to ensure that there would be virtually no or little incremental custodial costs for recyclable paper collection. This resulted in the development of a two-bucket waste sorting system for tenants and a two-compartment cart for janitors (i.e., clear for paper, black for trash). • CBRE engaged custodial staff to monitor the program and communicate with tenants about contamination and participation. • The waste/recycling contractor assisted in designing an orientation video and educational posters. • CBRE seeks input from prospective contractors to solicit interest, participation, and feedback from all stakeholders on a regular basis.
Align waste and resource efficiency services	<ul style="list-style-type: none"> • CBRE manages all contract services, allowing for a systems approach. • Contractors interact with the tenants, who ultimately influence waste management and generation.
Establish transparent pricing for services	<ul style="list-style-type: none"> • CBRE directed its single-source waste/recycling contractor to "unbundle" pricing structures to specify hauling and disposal charges on a variable basis (i.e., cost per haul, cost per ton tipped) rather than charge flat monthly fees for all services. • The waste/recycling contractor charges a flat fee per ton for recyclable materials to cover handling/processing and brokerage fees. This structure minimizes the contractor's risk of volatile recycling markets. • The waste/recycling contractor specifies additional costs of recycling equipment and hauling in addition to recycling revenue. The contractor charges a flat fee per ton to cover the cost of service, to reduce the risk of volatile recycling markets, and to encourage recycling when the market is strong. • The pricing system allows variable savings, such as avoided hauling and disposal, to flow back into the program.
Cap compensation for garbage service	<ul style="list-style-type: none"> • CBRE limited waste hauling/disposal service by changing to an on-call service, which requires the custodial contractor to request hauling services from the waste/recycling contractor only when needed.
Provide direct financial incentives for resource efficiency	<ul style="list-style-type: none"> • CBRE designed an incentive structure for all relevant stakeholders including the waste and recycling contractor, custodial contractor, and tenants.



Who is supplying RM services?

Ask a waste generator to consider a switch to RM contracting and you're likely to hear, "This sounds great, but is anyone actually supplying these services?" To create and respond to the growing demand for RM, an increasing number of companies are offering RM-like services—from industrial cleaning companies to property managers to traditional waste hauling companies.



According to WasteWise partner Waste Management (WM), the largest player in the U.S. waste industry, RM is here to stay for the foreseeable future. WM established a separate division to market these "total waste management" services to its major accounts nationwide. Starting with a staff of three in 1997, the division has grown to 170 account management employees today. WM focuses primarily—but not exclusively—on targeting chemical, automobile, and pharmaceutical companies whose annual revenues range from small players of several hundreds of thousands of dollars to billion dollar corporations such as General Motors. WM has approximately 40 RM customers at 220 sites, representing approximately \$100 million in contract value, and it plans to expand to target other, less penetrated sectors and geographic regions.

WM is not the only supplier in the game. Other small and medium-sized companies from different service sectors provide clients with value-added RM services. At an EPA-sponsored forum in June 2001, nine regional and national companies that currently provide or plan to offer RM services shared their experiences and the benefits, challenges,

and potential opportunities of RM. While visibility for RM in industry as a whole remains low, and RM's future is far from assured, concrete evidence supports a bullish outlook (see Benefits to Suppliers on page 17).

Suppliers Meet Challenges

Finding internal support. Although the level of interest from potential RM suppliers is on the rise, several hurdles must be overcome to be a successful RM contractor and pave the way for a more prominent RM service industry. For all suppliers—particularly RM suppliers accustomed to the profits from disposal volume sales—having a champion from senior management and achieving buy-in from employees are key to successfully adding this new business offering.

Increasing customer awareness. Contractors cite another barrier to more rapid RM expansion—customers' lack of awareness, understanding, and expectations of the RM service model. RM represents a new supplier relations paradigm for which little information is available. For this reason, potential

customers might be suspicious of suppliers' motives in encouraging RM. Recently, however, independent sources have developed case studies on RM to help increase awareness.

Working together. Both suppliers and customers must change their focus from unit cost of disposal to total enterprise-wide costs and potential savings from resource efficiency. Some clients might not recognize the inherent "give-and-take" of RM, in which the contract fosters a strategic partnership through shared savings. Although the intent of RM contract terms and conditions is to cultivate such a transition, the change in mindset from "squeezing" the contractor to focusing on joint opportunities for gain through resource efficiency is often difficult, given entrenched habits.

Establishing a baseline. Another concern of RM suppliers is the lack of total baseline service levels and costs from which to document savings associated with RM innovations. Without comprehensive baseline data from management accounting systems, establishing an equitable basis for compensation is rather difficult, as is establishing accountability for subsequent savings.

Sustaining profits. Finally, as an RM program evolves and the supplier recovers the "low hanging fruit" from the customers' waste stream, it might become increasingly challenging for RM suppliers to maintain profitability from

recycling alone. Consequently, a key ingredient in sustaining progress is to provide a flexible compensation structure that allows the RM contractor to profit from achieving the next level of resource efficiency by optimizing "upstream" processes to reduce waste.

This *Update* highlights three cases in which successful supplier relationships have been able to overcome these challenges to achieve remarkable results.

RM Supplier Viewpoint...

Other RM players, such as WasteWise Partner National Disposal Solutions (NDS), incur low capital requirements, as the RM service emphasizes information management services instead of ownership of capital equipment.



National Disposal Solutions

"By determining the clients' waste reduction goals and metrics of success up front, we can align the applications of our resources to meet these needs. NDS single-source services begin with documentation of current environmental cost structures. This helps in the design of waste reduction programs, data management, communication, and training plans that reduce our clients' costs on hauling and other support services by 10 percent or more."

—Greg Leonard, National Disposal Solutions

immediate source of savings, the appeal of RM in the longer term is in the ability to leverage and align their contracts to harness the supplier's core competencies to achieve higher long-term, cost-effective resource efficiency.

What Works With Customers

The success of RM rests not only on establishing a reliable, diverse, and competitive supplier base, but also on developing demand, which ultimately hinges on providing a marketable value to clients. RM services provide one point of contact for the customer, alleviating the need to manage multiple vendors and providing a unified view of waste across the enterprise through a standard data reporting function. A universal benefit cited by most suppliers is the ability of customers—by shifting "non-core" contract management and other responsibilities onto its resource manager—to rededicate these resources to other mission-driven tasks. While volume-based purchasing and consolidation might be an immediate source of savings, the appeal of RM in the longer term is in the ability to leverage and align their contracts to harness the supplier's core competencies to achieve higher long-term, cost-effective resource efficiency.

Benefits to Suppliers

Why have some companies taken the lead in offering RM services? Suppliers list the following benefits:

- Earn potential performance bonuses and shared savings for reaching customers' recycling and other performance targets.
- Build strategic partnerships that enhance suppliers' understanding of the plant activities, ability to identify cost-saving innovations.
- Find opportunities to broaden the scope of services, including:
 - Providing wider range of high-value utility and environmental support functions.
 - Addressing internal "upstream" (e.g., training, data management, material use) and external (e.g., hauling, recycling) functions.
- Improve market position and financial valuation of public companies by diversification and differentiation of services.
- Retain customers in an environment of high account turnover due to added-value services.
- Need low capital requirements for entry into a market emphasizing knowledge-based management services.
- Share risks between supplier and client.

Resource Management: Enhancing Waste Diversion in the Future

As the case studies and testimony of suppliers attest, RM is making in-roads as an alternative to traditional waste and recycling contracting practices. Applying RM nationwide could enhance both suppliers' profitability and waste generators' resource efficiency and cost effectiveness, leading to more sustainable practices in sourcing, use, and end-of-life management of materials.

In 1999, approximately 110 million tons of waste discarded in the United States were managed through contractual relationships.¹ Experience to date suggests that if uniformly adopted and implemented on a nationwide basis, RM contracts have the potential to eliminate nearly half of these discards (55 million tons),² through a combination of enhanced recovery of recyclables, recycling market development, and waste prevention. This would lead to a national diversion rate of 52 percent, well above EPA's national goal, and would avoid more than \$2 billion in disposal costs³ for generators. Moreover, if RM helped recover half of the "contracted" paper discard stream alone (approximately 12 million

tons), the United States would avoid 9 million tons of carbon equivalent (MTCE) of greenhouse gas emissions. These savings are equivalent to keeping 6.8 million cars off the road for a year, or avoiding emissions from the generation of electric power for 5.4 million households for one year.⁴

Coming Soon

As part of WasteWise's continuing efforts to keep partners informed about RM contracting strategies, EPA will be developing tools and guidance materials so that WasteWise partners can investigate and successfully implement RM. These tools and materials will include the following:

- Sample contract language to help partners revisit their current waste hauling and recycling contracts
- An assessment tool to allow potential RM users to gauge the impact of this new approach on their organization.
- A manual to provide partners with a step-by-step "how-to" guide on developing an RM contracting model within their organization.
- Technical workshops to further demonstrate, educate, and engage WasteWise partners.

As always, the WasteWise Web site will continue to provide updates about RM and new resources as they become available; visit <www.epa.gov/wastewise/wrr/rm.htm>.

RM holds the promise of transforming the way the waste management industry defines the value of its services and the way it generates profit. At this point, RM is not common knowledge to companies' purchasing and environmental departments, nor is it broadly

understood by contractors. RM's future rests on bringing the supplier and customer community together to identify mutually beneficial opportunities and overcome lurking challenges. Although

¹ Assumes two-thirds of the 1999 U.S. municipal solid waste stream reported in EPA's *Characterization of Municipal Solid Waste: 1999 Update*. Of this amount, approximately 55 to 65 percent is residential and approximately 35 to 45 percent is commercial. These figures exclude construction and demolition debris, wastewater sludge, and some non-hazardous industrial wastes.

² Based on RM research performed by The Tellus Institute at more than 20 organizations.

³ Assumes \$50 per ton and no hauling or other disposal savings. Based on potential elimination of 55 million tons.

⁴ WasteWise Update: *The Measure of Success—Calculating Waste Reduction*. July 1999, EPA530-N-99-003.

Keys to Successful RM Contracting

The experiences of GM's Orion Assembly Plant, PSEG, and CBRE's One Beacon Street indicate several key actions for successful RM contracting:

Establish waste/recycling baseline and data system. Establishing baseline cost and service data on waste/recycling is crucial to define goals, establish targets, and design the details of an RM program, as well as to gauge the potential benefits of implementing RM. Maintaining a centralized database enables both the suppliers and customers to assess the RM program and identify waste reduction opportunities.

Redefine contractor relationship and contract structure. The essence of the RM concept is to align the incentives of the customers and suppliers into a strategic relationship for mutual gain from increased diversion. RM consolidates waste management to one point of contact and incorporates incentives into the contract to promote waste reduction, for example, direct incentives for resource efficiency innovations and caps on disposal compensation. Maintaining this relationship requires a new perspective by both parties and compensation structures to match.

Seek top management support. Implementing RM in most cases implies centralizing management of waste contracts and redefining the scope of service from waste disposal and hauling to more comprehensive, value-added services. Such organizational change often meets with resistance, for example, from purchasing managers, who might feel they are losing autonomy

in supplier selection, or from environmental staff, who might be concerned with diminished job responsibility. Senior management support is critical for a smooth transition from the traditional disposal contract to RM practices.

Incorporate lifecycle thinking. The contractor might initially focus on increasing recycling rates from the baseline for those materials with lower capture rates. As the RM program matures, however, the resources required to achieve incremental diversion gains might become uneconomical. At this point, the RM program could focus on waste prevention opportunities and additional services. Thus, the compensation mechanism should create incentives for the contractor to focus on waste prevention and other value-added activities, such as training employees in material conservation techniques. The viability and attractiveness of RM to a contractor will depend on its ability to ensure long-term profitability through strategic and equitable partnerships with customers. Incorporating lifecycle thinking into the entire supply chain can help achieve this.

One size does not fit all. Success of RM depends mainly on cooperation between suppliers and customers. The case studies highlighted in this *WasteWise Update* serve as an illustration of possible formats of RM practice. Success relies on creativity in applying the practices and maintaining enough flexibility in the contract to evolve over time with changing customer requirements, goals, and industry or other influencing circumstances.

RM is consistent with established and emerging business trends, such as performance-based contracting and outsourcing "non-core" functions, some customers and suppliers need flexible, well-defined RM practices, tools, and information before they are willing to take the road less traveled. Ongoing work performed by The Tellus Institute and sponsored by U.S. EPA's Office of Solid Waste and other state partners seeks to provide direct contract assistance to organizations that rely on disposal and/or recycling contracts, build RM supplier capacity, and develop tools and guidance materials to spur broader adoption of RM nationwide.

Research to date demonstrates that RM is widely applicable in commercial, industrial, institutional, and municipal settings, although RM might not be the most cost effective, appropriate, or feasible alternative in all cases. Nonetheless, case studies demonstrate that RM is applicable in diverse settings and uses standard replicable practices, including:

establishing and regularly updating baseline information on contract costs and service levels; achieving support from senior management and other internal players; and changing contractor relationships and compensation (see *Keys to Successful RM Contracting* above).

RM uses contracts to change the terms of business and redirect funds from supporting trash service to encouraging recycling and other more cost-effective resource-efficient management methods. The total costs of trash and recycling remains the same or even diminishes under RM, but the nature of compensation radically changes contractor incentives to decrease waste service and increase reduction, reuse, and recycling. In doing so, RM transforms dollars spent on waste contracting from a constraining liability to a liberating asset, creating a voluntary, market-driven mechanism for organizations to improve both their financial and environmental bottom lines.

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